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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,192	07/27/2005	Astrid Heinzmann	262391US0PCT	7390
22850	7590	02/04/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
MAYES, MELVIN C				
ART UNIT		PAPER NUMBER		
1791				
NOTIFICATION DATE		DELIVERY MODE		
02/04/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/517,192

**Applicant(s)**

HEINZMANN ET AL.

**Examiner**

Melvin C. Mayes

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 13-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date 1/24/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

(1)

Applicant's election with traverse of Claims 1-12 in the reply filed on November 12, 2007 is acknowledged. The traversal is on the ground(s) that the search of all the claims would not impose a serious burden on the Office. This is not found persuasive because Claims 1-12 and Claims 13-20 and Claims 21-24 do not share a common special technical feature. The special technical feature of Claims 21-24 of an electrical external contact of having a plurality of individual bending articulations arranged in one plane is not shared by Claims 13-19 in which the special technical feature is delaminating microstructure disturbances which reduce the tensile strength while maintaining the compression strength of the stack which feature is not shared by Claims 1-12 in which the special technical feature is specific microdisturbances incorporated in the actuator structure which can be subject to stress-reducing growth during polarisation.

The requirement is still deemed proper and is therefore made FINAL.

### ***Specification***

(2)

The disclosure is objected to because of the following informalities: reference to claims should be deleted.

Appropriate correction is required.

*Claim Rejections - 35 USC § 112*

(3)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(4)

Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 claims that “additionally **the basic metallic coating** and/or the external contact is formed elongation-resistant or elastic at least in the area of the microdisturbances.” There is no description in the specification of how the basic metallic coating can be formed as elongation-resistant or elastic to enable one skilled in the art to make a basic metallic coating elongation-resistant or elastic. The specification describes how the external contact on the basic metallic coating is formed to be elongation-resistant or elastic, but does not enable how the form the basic metallic coating to be elongation-resistant or elastic. The claim could read “additionally the external contact is formed elongation-resistant or elastic at least in the area of the microdisturbances,” which is enabled by the specification.

(5)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(6)

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the **at least two** opposite outer surfaces" in line 9. There is insufficient antecedent basis for this limitation in the claim. Line 5 only claims "opposite outer surfaces" not "at least two opposite outer surfaces."

Claim 1 claims microdisturbances "parallel and spaced **to** the inner electrodes" which is unclear. Does Applicant mean "parallel and spaced from the inner electrodes" since "spaced to" implies that the microdisturbances extend to the inner electrodes instead of being parallel and spaced apart from the inner electrodes? It is not clear how the microdisturbances can be both parallel to the inner electrodes and spaced "to" the inner electrodes.

Claim 2 claims "prevent locally limited that the green foils are sintered together." This language is unclear.

***Claim Rejections - 35 USC § 103***

(7)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(8)

Claims 1, 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. 5,237,239.

Inoue et al. disclose a method of making a piezoelectric actuator comprising:  
stacking green sheets printed with paste for internal electrodes and paste for slit forming material having carbon as the principal component;  
sintering, including decomposing the slit forming material to form vacancies for the slits;  
cutting the sintered body; and  
firing silver paste for external electrodes on side faces where internal electrodes are exposed and connecting lead wires to the internal electrodes (thus a basic metallic coating and external contacts which are elongation resistant or elastic).

Each slit has a width in the lamination direction of 5  $\mu\text{m}$  (thus specific microdisturbances), and each slit is formed from the side face of the actuator into its interior (thus along the longitudinal axis of the stack essentially parallel and spaced from the inner electrodes in the area of the opposite outer surfaces to which inner electrodes are brought out). The plurality of slits relax the tensile stress generated, therefore the breakdown voltage that leads to mechanical breakdown can be made higher and hence an actuator that enables one to take out a large displacement can be obtained (col. 6, line 35 – col. 9).

By providing the plurality of slits of width of 5  $\mu\text{m}$  in the lamination direction from the side face of the actuator into its interior and parallel to the inner electrodes, specific microdisturbances are provided which obviously are capable of a pre-given, limited, stress-reducing growth into the interior of the actuator during polarisation of the actuator, as claimed.

Regarding Claim 2, the slits are formed from slit forming material having carbon as the principal component which form vacancies by thermal decomposition during sintering, thus locally preventing the green sheets from sintering together.

Regarding Claim 11, the actuator has inactive layers 5 on each end face of the actuator, thus electrode-free passive end layers.

(9)

Claims 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. 5,237,239 as applied to claims 1 and 13 above, and further in view of Heinz 6,411,018.

Heinz teaches that a piezoelectric actuator is advantageously modified by providing on the metal external electrode, a second layer formed as a net-like or woven cloth-like layer to prevent lateral fractures which can arise from the inner electrodes due to delamination and teaches that connections for electrical voltage can be produced by means of a wire that is laterally or perpendicularly wavy and soldered at points on the woven cloth-like external electrode (col. 1, line 40 - col. 2, line 25, Figs. 9, 11).

It would have been obvious to one of ordinary skill in the art to have modified the method of Inoue et al. for making a piezoelectric actuator by providing the external electrode as a silver metal electrode coating, layer of net-like or woven cloth-like layer on the metal electrode and wire that is laterally or perpendicularly wavy and soldered at points on the woven cloth-like layer, as taught by Heinz, to prevent lateral fractures which can arise from the inner electrodes due to delamination, the wire used to for connections for electrical voltage. By providing the wire as laterally or perpendicularly wavy and soldered at points on the woven cloth-like layer,



the external contact comprises a plane bending articulated electrode, designed to meander, with portions in electrical connection with the metal coating and with soldering portions, as claimed.

### *Conclusion*

(10)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin C. Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Phillip C. Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Melvin C. Mayes  
Primary Examiner  
Art Unit 1791

MCM  
January 29, 2008

/Melvin C. Mayes/  
Primary Examiner, Art Unit 1791